

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: LEE et al.

Group Art Unit: 2878

Serial No: 10/549,334

Docket: 8071-103 (OPP052118US)

Filed: September 11, 2006

For: **SYSTEM AND METHOD OF SILICON CRYSTALLIZATION**

Commissioner for Patents

P.O. Box 1450

Alexandria VA 22313

**REQUEST FOR A CORRECTED FILING RECEIPT**

Sir:

It is respectfully requested that an Updated Filing Receipt be issued correcting the title from "CRYSTALLIZATION APPARATUS AND METHOD OF AMORPHOUS SILICON" to "**SYSTEM AND METHOD OF SILICON CRYSTALLIZATION**" as indicated in the Preliminary Amendment filed on September 13, 2005 and the Declaration document filed on September 11, 2006. A copy of the Preliminary Amendment, Declaration and a copy of the original Filing Receipt which was mailed by the U.S. Patent and Trademark Office is attached with the correction indicated in red ink.

Respectfully submitted,

By:

  
\_\_\_\_\_  
Frank Chau

Reg. No. 34,136

Attorney for Applicant

F. CHAU & ASSOCIATES, LLC

130 Woodbury Road

Woodbury, New York 11797

Tel.: (516) 692-8888

Fax: (516) 692-8889

PATENT APPLICATION

Attorney Docket No. 8071-103 (OPP052118US)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

**APPLICANT:** Hyun-Jae KIM et al.

**INTERNATIONAL APPLN NO.:** PCT/KR2004/000520

**INTERNATIONAL FILING DATE:** 12 March 2004

**SERIAL NO:** Unassigned

**FILED:** Concurrently Herewith

**FOR:** CRYSTALLIZATION APPARATUS AND METHOD OF AMOPHOUS  
SILICON

Commissioner for Patents  
Box 1450  
Alexandria, VA 22313-1450

PRELIMINARY AMENDMENT

Sir:

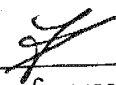
Prior to examination on the merits, please amend the above identified application  
as set forth hereinbelow:

CERTIFICATION UNDER 37 C.F.R. ' 1.10

hereby certify that this New Application Transmittal and the documents referred  
to as enclosed therein are being deposited with the United States Postal Service on this date  
September 13, 2005 in an envelope as "Express Mail Post Office to Addressee" Mail Label  
Number EV702320046US addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria,  
VA 22313-1450.

Frank Chau

(Type or print name of person mailing paper)

  
(Signature of person mailing paper)

**IN THE TITLE**

Please change the title from ~~CRYSTALLIZATION APPARATUS AND METHOD OF AMOPHOUS SILICON~~ to SYSTEM AND METHOD OF SILICON CRYSTALLIZATION.

## AMENDMENT TO THE CLAIMS

The following listing of claims will replace all prior versions, and listings, of claims in this application.

1. (Original) A silicon crystallization system comprising: a plurality of beam generators generating laser beams; an optical unit controlling a synthesized beam formed by synthesizing the laser beams from the beam generators to generate an output beam; and a stage mounting a substrate provided with a silicon layer to be polycrystallized by the output beam from the optical unit.
2. (Original) The system of claim 1, wherein a duration of the synthesized beam is longer than each of the laser beams generated by the beam generators.
3. (Original) The system of claim 2, further comprising a beam synthesizer generating the synthesized beam.
4. (Original) The system of claim 1, further comprising a chamber provided with the optical unit and the stage therein.
5. (Currently Amended) The system of ~~any one of claims 1 to 4~~ claim 1, wherein the silicon layer comprises an amorphous silicon layer.
6. (Original) A silicon crystallization system comprising: a plurality of beam generators generating laser beams; a beam splitter splitting a synthesized beam formed by synthesizing the laser beams from the beam generators into a plurality of beamlets; a plurality of optical units controlling the beamlets from the beam splitter; and a plurality of stages for

mounting substrates provided with silicon layers to be polycrystallized by the beamlets from the optical units.

7. (Original) The system of claim 6, wherein a duration of the synthesized beam is longer than each of the laser beams generated by the beam generators.

8. (Original) The system of claim 6, further comprising a beam synthesizer generating the synthesized beam.

9. (Original) The system of claim 6, further comprising a plurality of chambers, each chamber provided with one of the optical units and one of the stages therein.

10. (Original) The system of claim 9, wherein one of the chambers loads a substrate while another of the chambers performs polycrystallization.

11. (Original) The system of claim 9, wherein at least two of the chambers simultaneously performs polycrystallization.

12. (Currently Amended) The system of claim 10 ~~or 11~~, wherein the polycrystallization comprises sequential lateral solidification (SLS).

13. (Currently Amended) The system of claim 10 ~~or 11~~, wherein the number of the chambers is three.

14. (Currently Amended) The system of claim 10 ~~or 11~~, wherein the chambers perform the polycrystallization in turn.

15. (Currently Amended) The system of ~~any one of claims 6 to 11~~ claim 6, wherein the silicon layer comprises an amorphous silicon layer.

16. (Original) A silicon crystallization system comprising: a beam generator generating a laser beam; a beam splitter splitting the laser beam from the beam generator into a plurality of beamlets ; and a plurality of chambers, each chamber including an optical unit controlling one of the beamlet from the beam splitter and a stage for mounting a substrate provided with a silicon layer to be polycrystallized by the beamlet from the optical unit.

17. (Original) The system of claim 16, wherein one of the chambers loads a substrate while another of the chambers performs polycrystallization.

18. (Original) The system of claim 16, wherein at least two of the chambers simultaneously perform polycrystallization.

19. (Currently Amended) The system of claim 17 ~~or 18~~, wherein the polycrystallization comprises sequential lateral solidification (SLS).

20. (Currently Amended) The system of claim 17 ~~or 18~~, wherein the chambers perform the polycrystallization in turn.

21. (Original) A silicon crystallization method comprising: splitting a first laser beam into a plurality of beamlets; loading a first substrate provided with a first amorphous silicon layer into a first chamber; crystallizing the first amorphous silicon layer with one of the beamlets in the first chamber; loading a second substrate provided with a second amorphous silicon layer into a

second chamber during the crystallization of the first amorphous silicon layer; and crystallizing the second amorphous silicon layer with another of the beamlets in the second chamber.

22. (Original) The method of claim 21, further comprising: loading a third substrate provided with a third amorphous silicon layer into the third chamber during the crystallization of the second amorphous silicon layer; unloading the first substrate from the first chamber during the crystallization of the second amorphous silicon layer; and crystallizing the third amorphous silicon layer with one of the beamlets in the third chamber.

23. (Original) The method of claim 22, further comprising: generating a plurality of second laser beams; and synthesizing the second laser beams to form the first laser beam.

24. (Original) A silicon crystallization method comprising: splitting a first laser beam into first to third beamlets; loading a first substrate provided with a first amorphous silicon layer into a first chamber; crystallizing the first amorphous silicon layer with the first beamlet in the first chamber; loading a second substrate provided with a second amorphous silicon layer into a second chamber; crystallizing the second amorphous silicon layer with the second beamlet in the second chamber; loading a third substrate provided with a third amorphous silicon layer into the third chamber; and crystallizing the third amorphous silicon layer with the third beamlet in the third chamber, wherein the loading of the third substrate is performed during the crystallization of the first amorphous silicon layer or the crystallization of the third amorphous silicon layer.

25. (Original) The method of claim 24, further comprising: generating a plurality of second laser beams; and synthesizing the second laser beams to form the first laser beam.

26. (Original) The method of claim 24, wherein a duration of the crystallization of the first amorphous silicon layer overlaps a duration of the crystallization of the third amorphous silicon layer are simultaneously performed.

27. (Original) The method of claim 26, wherein the crystallization of the first amorphous silicon layer is completed before completion of the crystallization of the third amorphous silicon layer.



REMARKS

Entry of the Preliminary Amendment prior to the examination of the above-identified application on the merits is respectfully requested. No new matter has been added by the Preliminary Amendment. Early and favorable consideration of this application is requested.

Respectfully submitted,

F. CHAU & ASSOCIATES, LLC

By:

  
Frank Chau

Reg. No. 34,136

Attorney for Applicant

F. CHAU & ASSOCIATES, LLC  
130 Woodbury Road  
Woodbury, New York 11797  
(516) 692-8888  
FC:sg

**DECLARATION**

AS A BELOW NAMED INVENTOR, I hereby declare that:

My residence, post office address and citizenship are as stated next to my name.

I believe that I am the original, first and sole (if only one name is listed below), or an original, first and joint inventor (if plural names are listed below), of the subject matter which is claimed and for which a patent is sought on the invention entitled:

**TITLE: SYSTEM AND METHOD OF SILICON CRYSTALLIZATION**

the specification of which either is attached hereto or indicates an attorney docket no.:

8071-103/fc (OPP052118US), or:

☒ was filed in the U.S. Patent & Trademark Office on September 13, 2005 and assigned Serial No. 10/549,334.

☐ and (if applicable) was amended on \_\_\_\_\_

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above. I acknowledge the duty to disclose information which is material to patentability and to the examination of this application in accordance with Title 37 of the Code of Federal Regulations '1.56. I hereby claim foreign priority benefits under Title 35, U.S. Code '119(a)-(d) or '365(b) of any foreign application(s) for patent or inventor=s certificate, or '365(a) of any PCT international application which designated at least one country other than the United States, listed below and have also identified below any foreign applications for patent or inventor=s certificate having a filing date before that of the application on which priority is claimed:

**Priority Claimed:**

10-2003-0015741  
(Application Number)  
filed)

KOREA  
(Country)

13/ 03/ 2003  
(Day/Month/Year)

I hereby claim the benefit under Title 35, U.S. Code, '120 of any United States application(s), or '119(e) of any United States provisional application(s), or '365(c) of any PCT International application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application(s) in the manner provided by the first paragraph of Title 35, U.S. Code, '112, I acknowledge the duty to disclose information material to patentability as defined in Title 37, The Code of Federal Regulations, '1.56(a) which became available between the filing date of the prior application and the national or PCT international filing date of this application:

PCT/KR2004/000520  
(Application Serial Number)

March 12, 2004  
(Filing Date)

(STATUS: patented, pending, abandoned)

(Application Serial Number)

(Filing Date)

(STATUS: patented, pending, abandoned)


I hereby appoint the practitioners associated with the Customer Number 22150 to prosecute this application and to transact all business in the U.S. Patent and Trademark Office connected therewith and with any divisional, continuation, continuation-in-part, reissue or re-examination application, with full power of appointment and with full power to substitute an associate attorney or agent, and to receive all patents which may issue thereon, and request that all correspondence be addressed to:

Frank Chau, Esq.  
F. CHAU & ASSOCIATES, LLC  
130 Woodbury Road  
Woodbury, New York 11797  
Area Code: 516-692-8888

I HEREBY DECLARE that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under '1001 of Title 18 U.S. Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

FULL NAME OF FIRST OR SOLE INVENTOR: LEE, Su-Gyeong

Citizenship: Korea


Inventor's signature: 

Date: August 30, 2006

Residence & Post Office Address: 202,1546-10, Sinlim 9-dong, Kwanak-gu, Seoul, Korea

FULL NAME OF SECOND INVENTOR: KIM, Dong-Byum

Citizenship: Korea

Inventor's signature: 

Date: August 30, 2006

Residence & Post Office Address: :Hyundai Villa 403,43-1, Cheongdam-dong, Kangnamgu, Seoul, Korea

FULL NAME OF THIRD INVENTOR: KANG, Myung-Koo

Citizenship: Korea

Inventor's signature: 

Date: August 30, 2006

Residence & Post Office Address: Misung Apt. 3-205, Sincheon-dong, Songpa-gu, Seoul, Korea

FULL NAME OF FOURTH INVENTOR: CHUNG, Ui-Jin

Citizenship: Korea

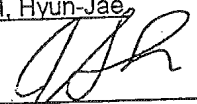
Inventor's signature: Chung Ui Jin

Date: August 30, 2006

Residence & Post Office Address: Jookgong Greenville Apt. 103-104, 1258, Maetan 3-dong, Paldal-gu, Suwon-si, Gyeonggi-do, Korea

FULL NAME OF FIFTH INVENTOR: KIM, Hyun-Jae

Citizenship: Korea

Inventor's signature: 

Date: August 30, 2006

Residence & Post Office Address: Cheonggu Apt. 601-903, 123, Imae-dong, Bundang-gu, Seongnam-si, Gyeonggi-do, Korea



## UNITED STATES PATENT AND TRADEMARK OFFICE

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APPL NO.	FILING OR 371 (c) DATE	ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO	DRAWINGS	TOT CLMS	IND CLMS
10/549,334	09/11/2006	2878	1780	8071-103 (OPP052118US)	6	27	5

CONFIRMATION NO. 6690

22150  
 F. CHAU & ASSOCIATES, LLC  
 130 WOODBURY ROAD  
 WOODBURY, NY 11797

## FILING RECEIPT



\*OC000000021165539\*

Date Mailed: 11/13/2006

Receipt is acknowledged of this regular Patent Application. It will be considered in its order and you will be notified as to the results of the examination. Be sure to provide the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION when inquiring about this application. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. If an error is noted on this Filing Receipt, please mail to the Commissioner for Patents P.O. Box 1450 Alexandria Va 22313-1450. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections (if appropriate).

## Applicant(s)

Su-Gyeong Lee, Seoul, KOREA, REPUBLIC OF;  
 Dong-Byum Kim, Seoul, KOREA, REPUBLIC OF;  
 Myung-Koo Kang, Seoul, KOREA, REPUBLIC OF;  
 Ui-Jin Chung, Gyeonggi-do, KOREA, REPUBLIC OF;  
 Hyun-Jae Kim, Gyeonggi-do, KOREA, REPUBLIC OF;

**Power of Attorney:** The patent practitioners associated with Customer Number 22150.

## Domestic Priority data as claimed by applicant

This application is a 371 of PCT/KR04/00520 03/12/2004

## Foreign Applications

REPUBLIC OF KOREA 10-2003-0015741 03/13/2003

If Required, Foreign Filing License Granted: 11/08/2006

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US10/549,334**

Projected Publication Date: 02/15/2007

Non-Publication Request: No

Early Publication Request: No

Title

system and method of Silicon Crystallization  
~~Crystallization apparatus and method of amorphous silicon~~

Preliminary Class

250

## PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

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